

REMARKS

In section 4 of the Office Action, the Examiner rejected claims 15, 16, 18, and 19 under 35 U.S.C. §102(b) as being anticipated by Hartsough.

However, claims 15, 16, 18, and 19 are not anticipated by Hartsough.

The problem faced by the inventors in the present application was to form a thin film having a predetermined and predictable optical characteristic when performing metal sputtering coupled with reacting the metal with a reactive gas.

Adjusting the flow rate of the reactive gas during thin film formation had been attempted in an effort to achieve the predetermined and predictable optical characteristic. However, when the flow rate of the reactive gas is adjusted during thin film formation, the optical characteristic follows a curve that includes hysteresis. That is, the optical characteristic follows one curve as the flow rate is adjusted upward and a different curve as the flow rate is adjusted downward during thin film formation. This hysteresis makes it very difficult to obtain the predetermined and predictable optical characteristic.

The inventors discovered that the predetermined and predictable optical characteristic could, however, be

achieved by adjusting the speed of the substrate through the sputtering and reactive gas zones during sputtering of the metal and the reacting of the metal with the reactive gas because the optical characteristic exhibits no hysteresis effect as the speed of the substrate is so adjusted.

Hartsough does not disclose the present invention. That is, Hartsough does not disclose adjusting the conveying speed while the target is sputtered in the sputtering zone and while the intermediate thin film is reacted with the reactive gas in the reactive zone so as control an optical characteristic of the thin film in a hysteresis region which would have otherwise occurred if the optical characteristic had been controlled by adjusting a rate of flow of the reactive gas while the target is sputtered in the sputtering zone and while the intermediate thin film is reacted with the reactive gas in the reactive zone.

The premise of the Examiner's rejection is that Figure 5 of Hartsough discloses adjusting the speed of the substrate by running the speed of the substrate from stop to a speed in the range of 60 rpm to 400 rpm. However, this premise does not have a bearing on independent claim 15.

The speed of the substrate in Hartsough is run up to its process speed before film formation actually starts.

Hartsough does not disclose that the speed of the substrate is adjusted during actual film formation.

Because Hartsough fails to disclose adjusting the speed of the substrate during thin film formation, Hartsough does not disclose the invention of independent claim 15.

Therefore, independent claim 15 is not anticipated by Hartsough.

Because independent claim 15 is not anticipated by Hartsough, dependent claims 16, 18, and 19 *per force* are not anticipated by Hartsough.

In section 6 of the Office Action, the Examiner rejected claims 18 and 21 under 35 U.S.C. §103(a) as being unpatentable over Hartsough in view of Sproul.

Sproul likewise does not disclose adjusting the speed of conveying during thin film formation so as control an optical characteristic of a thin film in a hysteresis region. Indeed, Sproul discloses neither adjusting the speed of conveying nor an optical characteristic hysteresis region.

Accordingly, Hartsough and Sproul would not have led the person of ordinary skill in the art to the invention of independent claim 15.

Therefore, independent claim 15 is not unpatentable over Hartsough in view of Sproul.

Because independent claim 15 is not unpatentable over Hartsough in view of Sproul, dependent claims 18 and 21 likewise are not unpatentable over Hartsough in view of Sproul.

In section 7 of the Office Action, the Examiner rejected claim 20 under 35 U.S.C. §103(a) as being unpatentable over Hartsough in view of Matsumoto.

Matsumoto likewise does not disclose adjusting the speed of conveying during thin film formation so as control an optical characteristic of a thin film in a hysteresis region. Indeed, Matsumoto discloses neither adjusting the speed of conveying nor an optical characteristic hysteresis region.

Accordingly, Hartsough and Matsumoto would not have led the person of ordinary skill in the art to the invention of independent claim 15.

Therefore, independent claim 15 is not unpatentable over Hartsough in view of Matsumoto.

Because independent claim 15 is not unpatentable over Hartsough in view of Matsumoto, dependent claim 20 likewise is not unpatentable over Hartsough in view of Matsumoto.

CONCLUSION

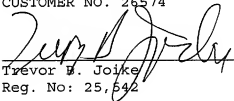
In view of the above, the claims of the present application patentably distinguish over the art applied by the Examiner. Accordingly, allowance of these claims and issuance of the present application are respectfully requested.

The Commissioner is hereby authorized to charge any additional fees that may be required, or to credit any overpayment, to account No. 501519.

Respectfully submitted,

SCHIFF HARDIN LLP
233 South Wacker Drive
Suite 6600
Chicago, Illinois 60606-6402
(312) 258-5774
CUSTOMER NO. 26574

By:


Trevor E. Joike
Reg. No: 25,542

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